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NOTES FROM THE PSYCHOLOGICAL LABORATORY OF CORNELL UNIVERSITY

By E. B. TITCHENER

1. ELECTROMAGNETIC CONTROL OF STOP-WATCH

This little instrument serves a twofold purpose: it safeguards the stop-watch against damage by careless handling, and it enables *E* or *O* to actuate the watch at a distance. The control was suggested to me by Jastrow's "Electric Attachment for the Stop Watch," which is figured in the catalogue of the Garden City Model Works, 1894, no. 11. It consists essentially of an electromagnet with pivoted armature, reinforced by a coiled spring. Watch and magnet are cased in a house of cast metal, with round window for the watch-face; and the clips that hold watch to stand, the pin that governs the tension of the spring, and the actuating button of the armature are all adjustable, so that the control may be applied to any make of watch. If the spring is set at the right degree of tension, and if the armature button is centred on the stem of the watch and moves in accurate alignment with the push-pin, the arrangement works—with the ordinary cheap stop-watch—on a single dry cell; a refractory watch may need two cells. The click at make, which is sometimes disturbing, may be lessened by papering the face of the armature.

The control is sold by the C. H. Stoelting Co., 3047 Carroll Avenue, Chicago, Ill.

2. CURVE TRACER

It has always been difficult to draw accurately arcs of circles of large radius. Since these curves are variously useful in laboratory work, I have asked the C. H. Stoelting Co. to manufacture Weitzenböck's device (described by K. Bühler, *Die Gestaltwahrnehmungen*, i., 1913, 72). The model supplied to the Cornell Laboratory has been subjected to preliminary tests, and appears to work as accurately as the Wolz original.

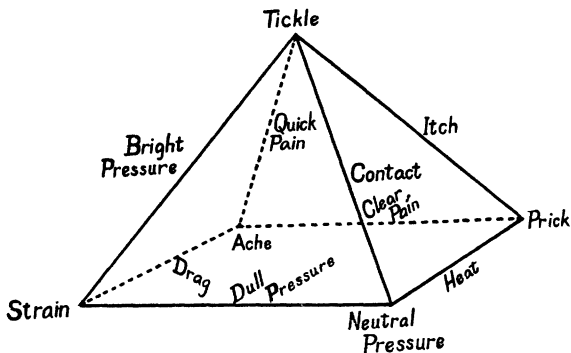
3. MODELS FOR THE DEMONSTRATION OF SENSORY QUALITIES

There is nothing like a geometrical model for bringing home to beginners in psychology the nature of the qualitative series

and the positional character of the qualitative attributes. Some years ago I described a demonstrational color pyramid (this JOURNAL, xx., 1909, 15 ff.). I wish now to say a word regarding a set of four simpler (frame or outline) models that I have found useful for demonstration in introductory courses. Dimensions do not matter, though on general principles the larger the models are made, the better.

The frames are built of light metal rods, blackened, whose ends are held together by cubical blocks of blackened wood. The blocks are bored to receive the posts of paper flags, which show the initials (or other symbols) of the terminal qualities. The rods further carry one or more sliding blocks for the similar indication of intermediate qualities. The frames thus constructed will stand on any face; the flags may be interchanged for demonstrational purposes within the given model; and wires may be stretched as wanted across surface-planes and interiors.

The four models are the color double pyramid; the taste tetrahedron and the smell prism (H. Henning, *Zeits. f. Psych.*, lxxiii., 1915, 254 f.; lxxiv., 1916, 212); and a touch pyramid, here figured.



I need hardly say that several of my determinations of the touch qualities are tentative, and that I regard their arrangement at best as only a rough approximation to the truth. I publish the figure because I think it marks the direction of recent work; because it may perhaps serve as the starting-point of new experiments; and also for the more personal reason that I have shown the model in my lectures of the past two years, and that the observers in certain investigations shortly to be published from the Cornell Laboratory have therefore been familiar with its terms and series.

For the place assigned to heat, see F. Cutolo, this JOURNAL, xxix., 1918, 445, 447 f.; for what I have called 'quick' pain, see E. Becher, *Arch. f. d. ges. Psych.*, xxxiv., 1915, 205. Warmth and cold for the present baffle me completely; I cannot bring them into qualitative relation with the terms of the figure; but the fact that they are left outstanding—I admit that it is a real difficulty—cannot of itself discredit the figure, and can still less discredit the underlying idea. Finally, auditory sensations may be systematized in various ways; and I have no doubt that some sort of closed figure will presently be found adequate to them. So long, however, as tonality and vocality are in debate, it is hardly safe to propose an arrangement of qualities.

4. SEWING MACHINE MOTOR

I am indebted to Dr. E. G. Boring, now of Clark University, for calling my attention to this motor, which is sold under the name "Sew E-Z" or "Home Motor," by the Hamilton Beach Manufacturing Company, Racine, Wis. The motor is intended for use with sewing machines, and in other household operations. For color mixing in the laboratory it has various merits; it requires practically no attention and stands hard usage. The motor is strongly cased, and its oil-cups are accessible. It will operate on either alternating or direct 110-volt current. It runs in both directions: the direction is reversed, very simply, by loosening a set-screw and shifting the brushes.

The motor is provided with a 6-speed rheostat, operated against a spring by a foot-treadle. The rheostat can be removed from its attachments, and turned by hand on the table. Thus separated, it is convenient and compact: 4 cm. high by 7 cm. diam. The motor itself with its base goes within a 15 cm. cube. The motor is light in weight, and though it is steady enough for ordinary color mixing must be clamped to the table if the discs are unbalanced (as in photometry by the Kirschmann method).

The motor has very little power, but great speed. Boring's tests show that on no-load the six points of the rheostat give about 2000, 4500, 7000, 9500, 12000 and 13000 r. p. m. A load of discs largely reduces this speed; but 20 cm. discs can be rotated on the fourth rheostat point at a speed of 4000 r. p. m., which is ample to prevent flicker.

The Cornell Laboratory has had the sewing machine motor in steady use since 1916, and the Clark Laboratory has recently adopted it. The current price (without discounts) of motor, rheostat, connecting cord and pulley is \$18.50.